Review Form 1.6

Journal Name:	**Chemical Science International Journal**
Manuscript Number:	**Ms_CSIJ_83663**
Title of the Manuscript:	**Effect of alkaline additives over V-based catalysts supported on □- Al2O3 for propane oxidative dehydrogenation**
Type of the Article	**Original Research Article**

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty'**, provided the manuscript is scientifically robust and technically sound.
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PART 1: Review Comments

	Reviewer's comment	**Author's comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Compulsory REVISION comments	**CRc1)** One of the objectives of this investigation is to evaluate the catalyst performance in the propane oxidative dehydrogenation reactions. However, the degree of advances made in the development of dehydrogenation catalysts relies also on the capacity to use "green" propane. Even though the development of technologies to produce renewable "green" propane are gaining traction, at present, sources of propane are mostly non-renewable. For completeness, it is suggested that the authors highlight the technological and environmental merits of their method. **CRc2)** As mentioned in the section below "*Minor REVISION comments*", one weak point of this paper is constituted by the fact that it is not well framed within the new works in the field, which have recently been proposed in the literature. The following two suggestions aim to help the authors to fill this gap. **CRc2a)** A promising new class of ODH-O2 catalysts has emerged in recent years which use boron as the active component. These catalysts are amongst the most active and selective reported to date for this reaction. **CRc2b)** The use of CO2 as a soft oxidant (ODH-CO2) has also gained interest due to the environmental advantages of utilising CO2. The authors are asked to provide their opinions about the above methods **CRc2a)** and **CRc2b)**. **CRc3)** It is commonly accepted that, regardless of the method of dehydrogenation, the balance of acid and base sites on the catalyst surface is of paramount importance. It is suggested to better highlight this aspect in the manuscript. **CRc4)** Several producing companies are of the opinion that future catalyst design in DDH and ODH-O2 should focus on improving selectivity to propene, while ODH-CO2 catalysts are limited by their low intrinsic activity with respect to CO2. What is the authors' opinion in this regard? **CRc5)** Higher reaction temperatures are favourable for the re-oxidation reaction, but unfavourable for the propylene production. Please, discuss this aspect with reference to the proposed method. **CRc6)** The authors did not mention the limitations of their method. It is advisable to include a brief analysis on this in their work. For instance: **CRc6a)** Catalytic dehydrogenation of alkanes, as an alternative route to light olefins, shows some major disadvantages, i.e., thermodynamic limitations, a high tendency to coking and consequently short catalyst lifetime. To couple catalytic dehydrogenation of alkanes with hydrogen oxidation is an interesting method as the presence of oxygen limits coking and extends catalyst lifetime. Despite the research efforts invested, industrial scale application of ODH reaction has not been realized to date, due to the low olefin selectivities shown by the catalysts employed. The main problem with most of the catalysts studied in ODH is that olefin yields do not exceed typically 30%. Please, provide a brief comment about this issue. **CRc6b)** Conventional transition metal oxides with pronounced redox properties such as supported vanadia catalysts have been explored, but have not been seen promising, as re-adsorption of olefins (leading to total oxidation) appears to limit the olefin yield. Please, analyse this aspect by linking the answer with the proposed method.	
Minor REVISION comments	**MR1)** Please, check the English of the manuscript; some typos have been detected. **MR2)** It is recommended to complete the list of references by citing the most relevant manuscripts which describe alternative methods of evaluating the performance of the catalyst in the oxidative dehydrogenation reactions of propane and which also take into account environmental aspects.	

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Optional/General comments	The subject treated in this work is topical. However, there are some gaps that, in my opinion, need to be filled. One of them, for instance, is that it is not well framed within the works in this area that are recently appeared in the literature. Answering the above questions **CRc2)** will help the authors to fill this gap. Moreover, the authors have not discussed the limitations, and perhaps the major drawbacks, of their method. The two questions **CRc6)** are intended to help the authors to fill this gap.	

PART 2:

	Reviewer's comment	**Author's comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Are there ethical issues in this manuscript?	*(If yes, Kindly please write down the ethical issues here in details)*	

Reviewer Details:

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